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Please cite this as:
Scott, W., & McCracken, L.M. (2016). Psychological assessment to identify patients at risk of post-surgical pain: The need for theory and pragmatism. *British Journal of Anaesthesia, 117 (5):* 546-548. doi:10.1093/bja/aew335

Psychological assessment to identify patients at risk of post-surgical pain: The need for theory and pragmatism

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There is good evidence that acute postoperative pain predicts the development of chronic pain following surgery, both across a number of surgical indications and procedures. Indeed, it appears that "pain predicts pain".[1] Thus, adequate management of acute pain following surgery is doubly important. Efforts to empirically identify patients most likely to experience relatively severe acute and chronic pain following surgery may facilitate screening of at-risk patients. Ultimately, this knowledge may lead to more effective pain management for those identified as needing particular care.

It is now widely appreciated that psychological factors play an important role in the experience of pain.[2] Evidence for this includes studies demonstrating that psychological factors measured before surgery can predict the experience of both acute and chronic pain after surgery.[1, 3-5] For example, higher pre-surgical levels of anxiety and pain catastrophizing --the tendency to magnify the threat value of pain, ruminate about pain, and feel helpless to control pain[6]-- are frequently implicated in greater levels of post-surgical pain.[7]

The paper by Caumo et al.[8] is a recent addition to the literature examining the relationship between pre-surgical psychological factors and postsurgical pain. Over three studies, the authors developed a new self-report questionnaire, the "Brief Measure of Emotional Preoperative Stress" (B-MEPS), and investigated its psychometric properties. There are several notable strengths in this work, including the comprehensive initial item content, expert input, a large sample, and sophisticated statistical methods, including those based on Item Response Theory. The results are promising as they produce a short measure that is internally consistent and demonstrates predictive utility even after controlling for

other relevant demographic, surgical, health-related, and psychological factors. At the same time, there are important lessons here for future research. These are both conceptual and pragmatic.

An important starting point when developing a new instrument to assess a psychological construct—whether to measure anxiety, catastophizing, or "emotional stress"—is to precisely define the intended construct. This should particularly include reference to theoretical assumptions and established principles within the domain of interest.[9, 10] Unfortunately, the B-MEPS does not appear to be based on an a priori definition of pre-surgical emotional stress. Instead, items for the B-MEPS were drawn from several heterogeneous measures without clear justification, including measures of depression symptoms, anxiety, minor psychiatric problems, and future self-perceptions. These do not appear to sit along a coherent dimension of behaviour or psychological events as most psychologists would understand it. "Pre-surgical emotional stress" is likewise an imprecise term.

As a consequence of both the imprecision in the intended construct and the diverse item sampling strategy, the conceptual link between the resulting B-MEPS items is unclear. All of the items appear in some way to reflect distress; however, the situational (i.e., self, life, and future) and emotional (i.e., worry, depressed mood, physical sensations) elements are extremely varied. In addition, the items and their differing response scale options appear to draw on both transient and more stable qualities, and mix dimensions, including severity, frequency, and idiosyncratic evaluations (e.g., "uncertainty," "afraid," "optimism"). In the absence of a clear conceptual definition of pre-surgical emotional stress, assessing the content validity of the B-MEPS is a challenge, and the progress represented by this instrument may be less than it could have been.

Given that the content for the B-MEPS was generated on the basis of items from questionnaires assessing symptoms of anxiety and depression, it is perhaps unsurprising that the B-MEPS correlated with a measure of catastrophizing, which is known to strongly correlate with these symptoms.[11] One advantage of measuring catastrophizing is that it is has been conceptualized within specific theoretical models. These models in turn include specific principles and processes through which events exert influence on each other, and these provide guidance for future research.[12] Greater understanding of the processes linking psychological factors to problematic postsurgical pain can inform the development of interventions to target those processes. Thus, an important extension following the development of the B-MEPS will be to identify a theoretical model of how emotional stress impacts on acute and chronic post-surgical pain. Such a model would be extremely useful for defining and refining the content of the measure.

Of course, there are many psychological experiences and events that we could choose to assess in relation to surgical outcomes, including thoughts, beliefs, feelings, psychiatric symptoms, past experiences, perceptions of social support, patterns of behaviour, and so forth. Indeed, a wide number of psychological constructs and corresponding assessment tools have been reported in this literature.[3, 4] If the aim is to improve our understanding, a logical strategy could be to identify and asses as many as possible of the potential psychological factors that may predict post-surgical pain. However, this may lead to problems with construct overlap and small levels of incremental validity with each new psychological factor. Another strategy is to instead apply current theoretical models as guides and aim for integration. Through such a strategy one may distil a wide range of psychological factors into a smaller number of dimensions that can explain the

complexity of psychological experiences and their impact on pain, dimensions that can be efficiently assessed and therapeutically targeted.[13]

Practically speaking, it is important to emphasize that screening for at-risk patients on the basis of pre-surgical psychological factors is only useful if (a) the factors assessed can be effectively modified through interventions, and (b) such interventions are readily available.[14] Therefore, any plan to implement pre-surgical assessment of psychological factors must have a corresponding plan for intervention. This is yet another reason for careful conceptual work at the outset. Specific psychological processes that are both practically measurable and manipulable in principle are useful. For example, specific behaviour patterns, such as anxiety-based avoidance, represent practical targets for change, while diffuse patterns of reactions or relatively heterogeneous constructs, such as "stress" are less practical to target therapeutically. Screening patients for psychological risk-factors that are impossible or impractical to target is disempowering, and may serve to implicitly or explicitly blame patients when recovery is poor.[14]

There is some evidence that psychologically-based interventions prior to or as an adjunct to surgery can reduce postsurgical pain.[15, 16] Despite this evidence and the many studies identifying psychological risk-factors, psychological interventions have rarely been integrated into the management of postsurgical pain in the past.[17] At the same time, there is recent evidence that integrating comprehensive assessment of psychological factors and implementing psychological intervention is feasible within patients' routine pre- and post-operative care pathway.[17] This is promising evidence for the future.

In summary, the identification of patients at-risk of post-surgical pain is an issue of great clinical concern. The effort around the B-MEPS is certainly positive in what it aims to do and may represent a practical improvement over existing measures. However, the B-

MEPS perhaps could have produced a more significant advance. Such an advance could have come from more precise and careful conceptualisation of the concept of emotional stress, more appeal to theory and modelling of the problem of stress in relation to post-surgical pain, and a greater eye on what is practical to do for treatment.

Authors' Contributions

W.S. and L.M.M. both conceived of and drafted the paper and approved the final version.

Conflicts of Interest

The authors declare no conflicts of interest.

Funding

This report is independent research supported by the National Institute for Health Research (NIHR Post Doctoral Fellowship, Dr Whitney Scott, PDF-2015-08-059). The views expressed in this publication are those of the authors and not necessarily those of the NHS, the National Institute for Health Research or the Department of Health.

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